Field Review of the Draft K-12 Grade Span Expectations (GSEs) in Science

Rhode Island Grade Span Expectations K-12 in Science Review – Grade Span 5-8

Please Note:

Field Review input needs to be returned to RIDE by Thursday, December 1, 2005.

Please return completed information to:

Pat Kozaczka RI Department of Education Office of Instruction 255 Westminster Street Providence, RI 02903 FAX: 401-222-6033

Pat.Kozaczka@ride.ri.gov

NOTE: You may submit a compilation of comments by attachment electronically to Peter McLaren at peter.mclaren@ride.ri.gov

Any questions regarding Field Review process may be directed to Peter McLaren (Peter.McLaren@ride.ri.gov) at 222-8454 or Linda A. Jzyk (Linda.Jzyk@ride.ri.gov) at 222-8473.

Field Review of the Draft K-12 Grade Span Expectations (GSEs) in Science

Directions

- 1) Begin the review process using the field review packet that most closely aligns with the grade level(s) in which you are most familiar. There are three review packets based upon the grade spans that will be used for large-scale assessment (K-4, 5-8, & high school).
- 2) Complete the Reviewer Information form found on page 2.
- 3) Read in the GSE packet "About the Draft Rhode Island K-12 Grade Span Expectations in Science: to understand how the draft science GSEs were developed and to familiarize yourself with the format of the document and the relationships between the Statements of Enduring Knowledge (EK), the state Assessment Targets, the Unifying Themes, the cross-grade span Stems and the GSEs.
- 4) Review **Appendix A: GSE Development in Science** for greater understanding of the nature of the science GSEs including the criteria for their design.
- 5) Read the following questions which form the basis for this field review document:
 - Question 1: Is the GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and state assessment?
 - Question 2: Are the differences between the GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K high school.
 - Question 3: Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's science program at that grade span?
 - Question 4: Does the set of GSEs within each Statement of Enduring Knowledge have the potential to promote coherent instruction? First, is each individual GSE coherent with the Statement of Enduring Knowledge under which it is listed? Second, as a whole, do these GSEs articulate well-balanced coverage of the major concepts within the EK statement? How could they be improved?
 - Question 5: What science content (important concepts) is missing in these draft science GSEs? Where are there gaps in content? This information is most essential for developing the science GSEs for local curriculum, instruction and assessment.
- 6) Locate the grade span you are reviewing in the GSE document. Notice that the GSEs listed in the review packet are detailed, in order, by domain, then by Statement of Enduring Knowledge, and finally by the corresponding assessment target. To help specify the GSE on the review packet the initial portion of the GSE, as listed in the GSE document, has been written next to the GSE number in the review packet.
- 7) Work through questions 1, 2, and 3 for each GSE within that grade span. Then answer question 4 about the set of GSEs within the Statements of Enduring Knowledge. Notice there is a place to code a response to each question and a place to provide comments.

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Rhode Island K-12 Grade Span Expectations in Science – Field Review Reviewer Information

Name	
District/Ouganization.	
	or Other
Position:	
Grade level and or course(s) you are teaching	
Number of years in that position	
Certification(s)	
E-mail Address:	
Science Curriculum/textbook used for instruc	tion
Participation on other district and statewide to curriculum committee, school improvement team	eams (e.g. Science GSE development team, district n, peer review team

Question #1: Clarity of GSE

LS2 (7-8)-5b analyzing how biotic and...

LS2 (7-8)–5c predicting the outcome of a... LS2 (7-8)–5d using a visual model (e.g., graph)...

Is the GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and state assessment? (Do I understand what learning will be assessed on the state assessment and the related curricular and/or instructional aspects?) If not, what aspect of the GLE needs further clarification? (E.g. clarify terminology, give examples, etc.)

LS1 - All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).

populations, & species).			
LS1 (5-8) - INQ+ SAE- 1 Using data and observ	ations about the	biodiversity	Comments
of an ecosystem make predictions or draw conclus	ions about how		
contributes to the stability of the ecosystem.	C		
GSEs	Curriculum/ Instruction	State Assessment	
LS1 (5-6) –1a recognizing that organisms	0	0	
LS1 (7-8) –1a giving examples of adaptations	О	0	
LS1 (7-8) –1b explaining how organisms with	0	0	
LS1 (5-8) SAE+FAF -2 Describe or compare how	different organ	isms have	Comments
mechanisms that work in a coordinated way to obt	0.0		
respond, provide defense, enable reproduction, or	maintain intern	al balance	
(e.g., cells, tissues, organs and systems). GSEs	Curriculum/	State	
GSES	Instruction	Assessment	
LS1 (5-6)-2a describing structures or	0	0	
LS1 (7-8)–2a describing structures of LS1 (7-8)–2a explaining how the cell, as the	0	0	
LS1 (7-8)–2b observing and describing	0	0	
LS1 (7-8)–2c observing, describing	0	0	
LS1 (5-8) POC -3 Compare and contrast sexual r	eproduction witi	h asexual	Comments
reproduction.	· P · · · · · · · · · · · · · · · · · ·		
GSEs	Curriculum/	State	
	Instruction	Assessment	
LS1 (5-6) –3a <u>defining reproduction as a</u>	0	0	
LS1 (5-6) –3b describing reproduction in	0	0	
LS1 (5-6) –3c investigating and comparing a LS1 (7-8)–3a explaining reproduction as a	0	0	
LS1 (7-8)–3a explaining reproduction as a LS1 (7-8)–3b describing forms of asexual	0	0	
LS1 (7-8)–3c describing sexual reproduction	0	0	
•			
LS1 (5-8) FAF -4 Explain relationships between a function of the cells, tissues, organs, and organ sy			Comments
GSEs	Curriculum/	State	
GDES	Instruction	Assessment	
LS1 (5-6)-4a identifying cells as the building	0	0	
LS1 (5-6)-4b recognizing and illustrating	0	0	
LS1 (5-6)-4a explaining that specialized	0	0	
LS1 (7-8)—4b comparing individual cells	0	0	
LS1 (7-8)–4c explaining how each type of	0	0	
LS2 - Matter cycles and energy flow	vs through	an ecosyste	em.
LS2 (5-8) INQ+SAE -5 Using data and observation	ns. predict outc	omes when	Comments
abiotic/biotic factors are changed in an ecosystem		omes when	Comments
GSEs	Curriculum/	State	
GSES	Instruction	Assessment	
LS2 (5-6) -5a identifying and defining an	0	0	
LS2 (7-8)–5a identifying and defining an LS2 (7-8)–5a identifying which biotic	0	0	
Zo= (, o) ou identifing which blotte			

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Question # 1: Clarity of GSE Is the GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and state assessment? (Do I understand what learning will be assessed on the state assessment and the related curricular and/or instructional aspects?) If not, what aspect of the GLE needs further clarification? (E.g. clarify terminology, give examples, etc.) LS2 - Matter cycles and energy flows through an ecosystem. LS2 (5-8) SAE- 6 Given a scenario trace the flow of energy through an ecosystem, beginning with the sun, through organisms in the food web, and into the environment (includes photosynthesis and respiration). GSEs Comments

0

0

LS2 (7-8)–6b describing the basic processes	0	0			
LS2 (7-8)– 6c explaining the relationship	0	0			
LS2 (7-8)-6d creating or interpreting a model	0	0			
between organisms and the physical environment (LS2 (5-8) SAE-7 Given an ecosystem, trace how matter cycles among and netween organisms and the physical environment (includes water, oxygen, food web, decomposition, recycling but not carbon cycle or nitrogen cycle).				
GSEs	Curriculum/	State			
	Instruction Assessment				
LS2 (5-6)-7a explaining the processes of	0	0			
LS2 (5-6)-7b completing a basic food web for	0	0			
LS2 (7-8)-7a diagramming or sequencing a	0	0			
LS2 (7-8)-7b developing a model for a food	0	0			
LS2 (7-8)-7c explaining the inverse nature	0	0			

LS3 - Groups of organisms show evidence of change over time (structures, behaviors, and biochemistry).

key to illustrate, compare, or interpret possible relationships among groups of organisms (e.g., internal and external structures, anatomical features).					
GSEs Curriculum/ State Instruction Assessment					
LS3 (5-6)-8a stating the value of, or reasons for	0	0			
LS3 (5-6)-8b following a taxonomic key to	0	0			
LS3 (7-8)-8a sorting organisms with similar	0	0			
LS3 (7-8)-8b explaining how species with	0	0			
LS3 (7-8)-8c recognizing the classification	0	0			

0

0

LS3 (5-8) POC-9 Cite examples supporting the concept that certain traits of organisms may provide a survival advantage in a specific environment and therefore, an increased likelihood to produce offspring.

LS3 (5-8) MAS+FAF - 8 Use a model, classification system, or dichotomous

LS2 (5-6)-6a identifying the sun as the major... LS2 (5-6)-6b sequencing the energy flow...

LS2 (5-6)-6c describing the basic processes... LS2 (7-8)-6a explaining the transfer of the...

GSEs	Curriculum/ Instruction	State Assessment
LS3 (5-6)-9a explaining how a population's	0	0
LS3 (5-6)-9b researching or reporting on	0	0
LS3 (5-6)-9c explaining how fossil evidence	0	0
LS3 (7-8)-9a explaining that genetic	0	0
LS3 (7-8)-9b gathering evidence that	0	0
LS3 (7-8)-9c differentiating between and.	0	0
LS3 (7-8)-9d explaining how natural selection	0	0
LS3 (7-8)-9e describing how scientists'	0	0

Comments

Comments

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Question #1: Clarity of GSE

Is the GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and state assessment? (Do I understand what learning will be assessed on the state assessment and the related curricular and/or instructional aspects?) If not, what aspect of the GLE needs further clarification? (E.g. clarify terminology, give examples, etc.)

LS4 - Humans are similar to other	species in n	nany ways,	and yet are unique among Earth's life forms.
LS4 (5-8) INQ-10 Use data and observations to su environmental or biological factors affect human abiotic).			Comments
GSEs	Curriculum/ Instruction	State Assessment	
LS4 (5-6)-10a identifying the biotic factors	O	O	
LS4 (5-6)-10b identifying the abiotic factors	0	0	
LS4 (5-6)-10c identifying the biotic	0	0	
LS4 (7-8)-10a predicting and explaining the	0	0	
LS4 (7-8)-10b predicting and explaining the	0	0	
LS4 (7-8)-10c researching and reporting on	0	0	
LS4 (5-6)-11a differentiating between LS4 (5-6)-11b observing, recording and LS4 (7-8)-11a tracing a genetic characteristic LS4 (5-6)-11c identifying that genetic material	0 0	0 0	
LS4 (5-8) POC-12 Describe the major changes that			
development from single cell through embryonic a trimesters: 1 st – group of cells, 2 nd - organs form, 3			
GSEs	Curriculum/ Instruction	State Assessment	
7.04.77.00.45.11.110.1			
LS4 (7-8)-12a identifying and sequencing the	0	0	
LS4 (7-8)-12a identifying and sequencing the LS4 (7-8)-12b describing the changes from	0	0	
LS4 (7-8)-12a identifying and sequencing the LS4 (7-8)-12b <u>describing the changes from</u> LS4 (7-8)-12c <u>comparing and contrasting</u>		0 0	

Are the differences between the GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This may be due to increasing difficulty in some related GSE.

LS1 - All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).

populations, & species).			
LS1 (5-8) - INQ+ SAE- 1 Using data and observ	vations about the	biodiversity	Comments
of an ecosystem make predictions or draw conclus			
contributes to the stability of the ecosystem.		•	
GSEs	Differences	Differences	
	are clear	not clear	
LS1 (5-6) –1a recognizing that organisms	0	0	
LS1 (7-8) –1a giving examples of adaptations	0	0	
LS1 (7-8) -1b explaining how organisms with	0	0	
LS1 (5-8) SAE+FAF -2 Describe or compare how	different organ	isms have	Comments
mechanisms that work in a coordinated way to ob			
respond, provide defense, enable reproduction, or			
(e.g., cells, tissues, organs and systems).			
GSEs	Differences	Differences	
	are clear	not clear	
LS1 (5-6)-2a describing structures or	0	0	
LS1 (7-8)-2a explaining how the cell, as the	0	0	
LS1 (7-8)–2b observing and describing	0	0	
LS1 (7-8)–2c observing, describing	0	0	
rat (10) pag a Company			Comments
LS1 (5-8) POC -3 Compare and contrast sext	ual reproduction	i with asexual	
reproduction.			
GSEs	Differences	Differences	
I C1 (5 6) 20 defining remoduction as a	are clear	not clear	
LS1 (5-6) –3a <u>defining reproduction as a</u> LS1 (5-6) –3b <u>describing reproduction in</u>	0	0	
LS1 (5-6) –3c investigating and comparing a	0	0	
LS1 (7-8)–3a explaining reproduction as a	0	0	
LS1 (7-8)–3a explaining reproduction as a LS1 (7-8)–3b describing forms of asexual	0	0	
LS1 (7-8)–3c describing forms of asexual LS1 (7-8)–3c describing sexual reproduction	0	0	
LSI (7-8)—SC describing sexual reproduction	O	0	
LS1 (5-8) FAF -4 Explain relationships between a	or among the str	ucture and	Comments
function of the cells, tissues, organs, and organ sy	stems in an orgo	anism.	
GSEs	Differences	Differences	
	are clear	not clear	
LS1 (5-6)-4a identifying cells as the building	0	0	
LS1 (5-6)-4b recognizing and illustrating	0	0	
LS1 (5-6)-4a explaining that specialized	0	0	
LS1 (7-8)–4b comparing individual cells	0	0	
LS1 (7-8)–4c explaining how each type of	0	0	
LS2 Matter cycles and energy flows	s through a	n ecosyster	n.
LS2 (5-8) INQ+SAE -5 Using data and observation	ons, predict outc	omes when	Comments
abiotic/biotic factors are changed in an ecosystem			
CSEs	Differences	Differences	1

LS2 (5-8) INQ+SAE -5 Using data and observations, predict outcomes when abiotic/biotic factors are changed in an ecosystem.			
GSEs	Differences are clear Differences not clear		
LS2 (5-6) -5a identifying and defining an	0	0	
LS2 (7-8)–5a identifying which biotic	0	0	
LS2 (7-8)–5b analyzing how biotic and	0	0	
LS2 (7-8)–5c predicting the outcome of a	0	0	
LS2 (7-8)–5d using a visual model (e.g., graph)	0	0	

Are the differences between the GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This may be due to increasing difficulty in some related GSE.

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LS2 Matter cycles and energy flows	s through a	n ecosyster	n.
LS2 (5-8) SAE- 6 Given a scenario trace the flow	of energy throu	igh an	Comments
ecosystem, beginning with the sun, through organ	isms in the food		
into the environment (includes photosynthesis and	l respiration).		
GSEs	Differences	Differences	
	are clear	not clear	
LS2 (5-6)-6a identifying the sun as the major	0	0	
LS2 (5-6)-6b sequencing the energy flow	0	0	
LS2 (5-6)–6c describing the basic processes	0	0	
LS2 (7-8)-6a explaining the transfer of the	0	0	
LS2 (7-8)–6b describing the basic processes	0	0	
LS2 (7-8)– 6c explaining the relationship	0	0	
LS2 (7-8)-6d creating or interpreting a model	0	0	
LS2 (5-8) SAE-7 Given an ecosystem, trace how	matter cycles an	nong and	Comments
between organisms and the physical environment			
web, decomposition, recycling but not carbon cycl			
GSEs	Differences	Differences	
T CO (C C) T	are clear	not clear	
LS2 (5-6)-7a explaining the processes of	0	0	
LS2 (5-6)-7b completing a basic food web for	0	0	
LS2 (7-8)-7a diagramming or sequencing a	0	0	
LS2 (7-8)-7b developing a model for a food LS2 (7-8)-7c explaining the inverse nature	0	0	
1.82. (7-8)-7c explaining the inverse nature	0	0	
	_	_	
LS2 (7-8)-7d conducting a controlled	vidence of c	° hange over	time (structures, behaviors, and biochemistry).
LS3 - Groups of organisms show ex LS3 - Groups of organisms show ex LS3 (5-8) MAS+FAF - 8 Use a model, classificati key to illustrate, compare, or interpret possible rel	vidence of c	hange over	time (structures, behaviors, and biochemistry). Comments
LS3 (7-8)-7d conducting a controlled LS3 - Groups of organisms show ever the controlled of the controlled of the controlled organisms (e.g., internal and external structures, controlled	vidence of c ion system, or di ationships amor anatomical feat	hange over chotomous ng groups of ures).	•
LS3 - Groups of organisms show ex LS3 - Groups of organisms show ex LS3 (5-8) MAS+FAF - 8 Use a model, classification	vidence of c	hange over	•
LS3 (7-8)-7d conducting a controlled LS3 - Groups of organisms show ever the controlled of the controlled of the controlled organisms (e.g., internal and external structures, controlled	vidence of c	hange over chotomous ng groups of ures). Differences	•
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show ex LS3 (5-8) MAS+FAF - 8 Use a model, classificati key to illustrate, compare, or interpret possible rel organisms (e.g., internal and external structures, of GSEs LS3 (5-6)-8a stating the value of, or reasons for	vidence of c ion system, or di ationships amor anatomical feata Differences are clear	hange over chotomous ng groups of ures). Differences not clear	•
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show ex LS3 (5-8) MAS+FAF - 8 Use a model, classificati key to illustrate, compare, or interpret possible rel organisms (e.g., internal and external structures, or GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to	vidence of c	hange over chotomous ng groups of ures). Differences not clear	•
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show ex LS3 (5-8) MAS+FAF - 8 Use a model, classificati key to illustrate, compare, or interpret possible rel organisms (e.g., internal and external structures, or GSEs	interpretation of control of cont	hange over chotomous ag groups of ures). Differences not clear	•
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show ever the strategy of t	vidence of c	hange over chotomous ng groups of ures). Differences not clear	•
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show ex LS3 (5-8) MAS+FAF - 8 Use a model, classificative to illustrate, compare, or interpret possible relorganisms (e.g., internal and external structures, of GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar LS3 (7-8)-8b explaining how species with LS3 (7-8)-8c recognizing the classification	vidence of c	hange over chotomous ng groups of ures). Differences not clear	Comments
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show expected the street of the s	vidence of c ion system, or di ationships amor anatomical featu Differences are clear	hange over chotomous ng groups of ures). Differences not clear	•
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show experience of comparisms show experience organisms (e.g., internal and external structures, of the conference of the con	vidence of c ion system, or di ationships amor anatomical featu Differences are clear	hange over chotomous ng groups of ures). Differences not clear	Comments
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show experiments of illustrate, compare, or interpret possible relorganisms (e.g., internal and external structures, of the control of	vidence of c ion system, or di ationships amor anatomical featu Differences are clear	hange over chotomous ng groups of ures). Differences not clear	Comments
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show experiments of illustrate, compare, or interpret possible relorganisms (e.g., internal and external structures, of the conduction of the c	vidence of c ion system, or di ationships amor anatomical featu Differences are clear	hange over chotomous ng groups of ures). Differences not clear	Comments
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show ever the state of the st	vidence of c	hange over chotomous ng groups of tures). Differences not clear o o o o in traits of ment and	Comments
LS3 (7-8)-7d conducting a controlled LS3 - Groups of organisms show ever the state of the st	vidence of c ion system, or di ationships amore anatomical featu Differences are clear oncept that certain specific environs oring. Differences	hange over chotomous ng groups of tures). Differences not clear o in traits of ment and	Comments
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show ever the state of the st	Differences are clear pring.	hange over chotomous ng groups of tures). Differences not clear in traits of ment and Differences not clear	Comments
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show extends (5-8) MAS+FAF - 8 Use a model, classification key to illustrate, compare, or interpret possible relorganisms (e.g., internal and external structures, of GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar LS3 (7-8)-8b explaining how species with LS3 (7-8)-8c recognizing the classification LS3 (5-6) POC-9 Cite examples supporting the coorganisms may provide a survival advantage in a stherefore, an increased likelihood to produce offsy GSEs LS3 (5-6)-9a explaining how a population's LS3 (5-6)-9b researching or reporting on LS3 (5-6)-9c explaining how fossil evidence	Differences are clear oring. Differences are clear oring.	hange over chotomous ng groups of tures). Differences not clear in traits of ment and Differences not clear	Comments
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show extends (5-8) MAS+FAF - 8 Use a model, classificating the villustrate, compare, or interpret possible relifications (e.g., internal and external structures, of GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8a sorting organisms with similar LS3 (7-8)-8a sorting organisms with similar LS3 (7-8)-8b explaining how species with LS3 (7-8)-8c recognizing the classification LS3 (5-8) POC-9 Cite examples supporting the coorganisms may provide a survival advantage in a stherefore, an increased likelihood to produce offsy GSEs LS3 (5-6)-9a explaining how a population's LS3 (5-6)-9c explaining how fossil evidence LS3 (5-6)-9c explaining how fossil evidence LS3 (7-8)-9a explaining that genetic	Differences are clear	hange over chotomous ag groups of ures). Differences not clear o in traits of ment and Differences not clear	Comments
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show explaining the value of, or reasons for LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8b explaining how species with LS3 (7-8)-8c recognizing the classification LS3 (5-6)-9c Cite examples supporting the coorganisms may provide a survival advantage in a stherefore, an increased likelihood to produce offsy GSEs LS3 (5-6)-9a explaining how a population's LS3 (5-6)-9c explaining how fossil evidence LS3 (7-8)-9b gesplaining that genetic LS3 (7-8)-9b gathering evidence that	vidence of c ion system, or di ationships amor anatomical feata Differences are clear o ncept that certai specific environi oring. Differences are clear	hange over chotomous ng groups of ures). Differences not clear o in traits of ment and Differences not clear	Comments
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show extends (183 (5-8) MAS+FAF - 8 Use a model, classificative to illustrate, compare, or interpret possible relorganisms (e.g., internal and external structures, of GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar LS3 (7-8)-8b explaining how species with LS3 (7-8)-8c recognizing the classification LS3 (5-8) POC-9 Cite examples supporting the coorganisms may provide a survival advantage in a stherefore, an increased likelihood to produce offst GSEs LS3 (5-6)-9a explaining how a population's LS3 (5-6)-9c explaining how fossil evidence LS3 (7-8)-9a explaining that genetic LS3 (7-8)-9b gathering evidence that LS3 (7-8)-9c differentiating between and.	vidence of c ion system, or di ationships amor anatomical feata Differences are clear ncept that certai specific environs oring. Differences are clear	hange over chotomous ng groups of ures). Differences not clear in traits of ment and Differences not clear	Comments
LS2 (7-8)-7d conducting a controlled LS3 - Groups of organisms show extends to illustrate, compare, or interpret possible relorganisms (e.g., internal and external structures, of GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar LS3 (7-8)-8b explaining how species with LS3 (7-8)-8c recognizing the classification LS3 (5-6)-9c Cite examples supporting the coorganisms may provide a survival advantage in a stherefore, an increased likelihood to produce offs; GSEs LS3 (5-6)-9a explaining how a population's LS3 (5-6)-9c explaining how fossil evidence LS3 (7-8)-9a explaining that genetic LS3 (7-8)-9b gathering evidence that LS3 (7-8)-9c differentiating between and. LS3 (7-8)-9d explaining how natural selection	vidence of c ion system, or di ationships amon anatomical feata Differences are clear o o o o o o o o o o o o o o o o o o	hange over chotomous ng groups of ures). Differences not clear in traits of ment and Differences not clear	Comments
LS3 (7-8)-7d conducting a controlled LS3 - Groups of organisms show ever the state of the st	on system, or diationships amonanatomical feature are clear oncept that certain specific environments. Differences are clear	hange over chotomous ag groups of ures). Differences not clear in traits of ment and Differences not clear	Comments

Are the differences between the GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This may be due to increasing difficulty in some related GSE.

LS4 - Humans are similar to other s	species in n	nany ways,	and yet are unique among Earth's life forms.
LS4 (5-8) INQ-10 Use data and observations to so environmental or biological factors affect human abiotic).		Comments	
GSEs	Differences are clear	Differences not clear	
LS4 (5-6)-10a identifying the biotic factors	0	0	
LS4 (5-6)-10b identifying the abiotic factors	0	0	
LS4 (5-6)-10c identifying the biotic	0	0	
LS4 (7-8)-10a predicting and explaining the	0	0	
LS4 (7-8)-10b predicting and explaining the	0	0	
LS4 (7-8)-10c researching and reporting on	0	0	
GSEs LS4 (5-6)-11a differentiating between	Differences are clear	Differences not clear	
LS4 (5-6)-11b observing, recording and.	0	0	
LS4 (7-8)-11a recognizing that characteristics	0	0	
LS4 (5-6)-11b tracing a genetic characteristic	0	0	
LS4 (5-6)-11c identifying that genetic material	0	0	
LS4 (5-8) POC-12 Describe the major changes that development from single cell through embryonic d trimesters: Ist – group of cells, 2 nd - organs form, 3	evelopment to n rd - organs mati	new born (i.e., ure	
GSEs	Differences are clear	Differences not clear	
LS4 (7-8)-12a identifying and sequencing the	0	0	
LS4 (7-8)-12b describing the changes from	0	0	
LS4 (7-8)-12c comparing and contrasting	0	0	
LS4 (7-8)-12d describing the patterns of	0	0	

Question 3: Expected Rigor	4-	1	41	
		iess rigo	rous tha	an what is presently expected in your school's
science program at that grade sp				
	ntifiable :	structure	es and ch	aracteristics that allow for survival (organisms,
populations, & species).				
LSI (5-8) – INQ+ SAE- 1 Using data and observe				Comments
ecosystem make predictions or draw conclusions at to the stability of the ecosystem.	bout how the	e diversity co	ontributes	
GSEs	More	As	Less	
	Rigorous	Rigorous	Rigorous	
LS1 (5-6) –1a recognizing that organisms LS1 (7-8) –1a giving examples of adaptations	0	0	0	
LS1 (7-8) –1b explaining how organisms with	0	0	0	
				_
LSI (5-8) SAE+FAF -2 Describe or compare how mechanisms that work in a coordinated way to obt				Comments
provide defense, enable reproduction, or maintain				
tissues, organs and systems).		1	1 _	
GSEs	More Rigorous	As Rigorous	Less Rigorous	
LS1 (5-6)-2a describing structures or	0	0	0	
LS1 (7-8)-2a explaining how the cell, as the	0	0	0	
LS1 (7-8)–2b <u>observing and describing</u> LS1 (7-8)–2c observing, describing	0	0	0	
LSI (5-8) POC -3 Compare and contrast sexu	al nonno de o	tion with ago		Comments
reproduction.	аі гергоаисі	uon wun ase	xuai	
GSEs	More	As	Less	
	Rigorous	Rigorous	Rigorous	
LS1 (5-6) –3a defining reproduction as a LS1 (5-6) –3b describing reproduction in	0	0	0	
LS1 (5-6) –3c investigating and comparing a	0	0	0	
LS1 (7-8)–3a explaining reproduction as a	0	0	0	
LS1 (7-8)–3b describing forms of asexual LS1 (7-8)–3c describing sexual reproduction	0	0	0	
LST (7-6)-5c describing sexual reproduction				
LSI (5-8) FAF -4 Explain relationships between o			ıd	Comments
function of the cells, tissues, organs, and organ sys	More More	As	Less	
GSES	Rigorous	Rigorous	Rigorous	
LS1 (5-6)-4a identifying cells as the building	0	0	0	
LS1 (5-6)-4b recognizing and illustrating LS1 (5-6)-4a explaining that specialized	0	0	0	
LS1 (7-8)–4b comparing individual cells	0	0	0	
LS1 (7-8)–4c explaining how each type of	0	0	0	
LS2 - Matter cycles and energy flow	vs throug	gh an eco	system.	
LS2 (5-8) INQ+SAE -5 Using data and observation abiotic/biotic factors are changed in an ecosystem.	· •	outcomes wh	en	Comments
GSEs	More Rigorous	As Rigorous	Less Rigorous	
LS2 (5-6) -5a identifying and defining an	0	0	0	
LS2 (7-8)-5a identifying which biotic	0	0	0	
LS2 (7-8)-5b <u>analyzing how biotic and</u> LS2 (7-8)-5c predicting the outcome of a	0	0	0	
LS2 (7-8)–5c predicting the outcome of a LS2 (7-8)–5d using a visual model (e.g.,	0	0	0	
graph)				

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Question 3: Expected Rigor				
Is the GSE more rigorous, similar	r to, or	less rigo	rous tha	n what is presently expected in your school's
science program at that grade sp	an?			
LS2 - Matter cycles and energy flow	vs throug	gh an eco	system.	
LS2 (5-8) SAE- 6 Given a scenario trace the flow beginning with the sun, through organisms in the (includes photosynthesis and respiration)		Comments		
GSEs	More Rigorous	As Rigorous	Less Rigorous	
LS2 (5-6)-6a identifying the sun as the major	0	0	0	
LS2 (5-6)-6b sequencing the energy flow	0	0	0	
LS2 (5-6)–6c describing the basic processes	0	0	0	
LS2 (7-8)–6a explaining the transfer of the	0	0	0	
LS2 (7-8)–6b describing the basic processes	0	0	0	
LS2 (7-8) – 6c explaining the relationship	0	0	0	
LS2 (7-8)–6d creating or interpreting a model			0	
LS2 (5-8) SAE-7 Given an ecosystem, trace how n	natter cycles	among and	between	Comments
organisms and the physical environment (includes	water, oxyg	en, food web		
decomposition, recycling but not carbon cycle or n	itrogen cycle	e).		
GSEs	More Rigorous	As Rigorous	Less Rigorous	
LS2 (5-6)-7a explaining the processes of	0	0	0	
LS2 (5-6)-7b completing a basic food web for	0	0	0	
LS2 (7-8)-7a diagramming or sequencing a	0	0	0	
LS2 (7-8)-7b developing a model for a food	0	0	0	
LS2 (7-8)-7c explaining the inverse nature	0	0	0	
LS2 (7-8)-7d conducting a controlled	0	0	0	
LS3 - Groups of organisms show ev	idence of	f change	over time	(structures, behaviors, and biochemistry).
LS3 (5-8) MAS+FAF - 8 Use a model, classification				Comments
illustrate, compare, or interpret possible relationsh		roups of org	anisms	
(e.g., internal and external structures, anatomical	features)			
GSEs	More	As	Less	
T 00 / F 0 0	Rigorous	Rigorous	Rigorous	
LS3 (5-6)-8a stating the value of, or reasons for	0	0	0	
LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar	0	0	0	
LS3 (7-8)–8a sorting organisms with similar LS3 (7-8)–8b explaining how species with	0	0	0	
LS3 (7-8)–8c recognizing the classification	0	0	0	
LS3 (5-8) POC-9 Cite examples supporting the co	ncent that co	rtain traits	of.	Comments
organisms may provide a survival advantage in a s				Comments
an increased likelihood to produce offspring	pecijie enva	оптет ини	merejore,	
GSEs				
	More Rigorous	As Rigorous	Less	
LS3 (5-6)-9a explaining how a population's	Rigorous	Rigorous	Rigorous	
	Rigorous o	Rigorous o	Rigorous	
LS3 (5-6)-9b researching or reporting on	Rigorous	Rigorous	Rigorous	
LS3 (5-6)-9b researching or reporting on LS3 (5-6)-9c explaining how fossil evidence	Rigorous	Rigorous	Rigorous	
LS3 (5-6)-9b researching or reporting on LS3 (5-6)-9c explaining how fossil evidence LS3 (7-8)-9a explaining that genetic LS3 (7-8)-9b gathering evidence that	Rigorous	Rigorous	Rigorous	
LS3 (5-6)-9b researching or reporting on LS3 (5-6)-9c explaining how fossil evidence LS3 (7-8)-9a explaining that genetic LS3 (7-8)-9b gathering evidence that LS3 (7-8)-9c differentiating between and.	Rigorous	Rigorous	Rigorous	
LS3 (7-8)-9a explaining that genetic LS3 (7-8)-9b gathering evidence that LS3 (7-8)-9c differentiating between and. LS3 (7-8)-9d explaining how natural selection	Rigorous	Rigorous	Rigorous	
LS3 (5-6)-9b researching or reporting on LS3 (5-6)-9c explaining how fossil evidence LS3 (7-8)-9a explaining that genetic LS3 (7-8)-9b gathering evidence that	Rigorous	Rigorous	Rigorous	

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Question 3: Expected Rigor

Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's science program at that grade span?

LS4 (5-8) INQ-10 Use data and observations to s environmental or biological factors affect human			notic).	Comments
GSEs	More Rigorous	As Rigorous	Less Rigorous	
LS4 (5-6)-10a identifying the biotic factors	0	0	0	
LS4 (5-6)-10b identifying the abiotic factors	0	0	0	
LS4 (5-6)-10c identifying the biotic	0	0	0	
LS4 (7-8)-10a predicting and explaining the	0	0	0	
LS4 (7-8)-10b predicting and explaining the	0	0	0	
LS4 (7-8)-10c researching and reporting on	0	0	0	
concept that genetic information is passed on from	both parent	s to offsprin	g.	
concept that genetic information is passed on from	both parent	s to offsprin	g. Less	
concept that genetic information is passed on from GSEs	More Rigorous	As Rigorous	Less Rigorous	
concept that genetic information is passed on from GSEs LS4 (5-6)-11a differentiating between	More Rigorous	As Rigorous	Less Rigorous	
Concept that genetic information is passed on from GSEs LS4 (5-6)-11a differentiating between LS4 (5-6)-11b observing, recording and	More Rigorous	As Rigorous	Less Rigorous	
Concept that genetic information is passed on from GSEs LS4 (5-6)-11a differentiating between LS4 (5-6)-11b observing, recording and LS4 (7-8)-11a recognizing that characteristics	More Rigorous	As Rigorous o	Less Rigorous	
LS4 (5-8) INQ+POC-11 Using data provided, seleconcept that genetic information is passed on from GSEs LS4 (5-6)-11a differentiating between LS4 (5-6)-11b observing, recording and LS4 (7-8)-11a recognizing that characteristics LS4 (5-6)-11b itacing a genetic characteristic LS4 (5-6)-11c identifying that genetic material	More Rigorous	As Rigorous	Less Rigorous	
Concept that genetic information is passed on from GSEs LS4 (5-6)-11a differentiating between LS4 (5-6)-11b observing, recording and LS4 (7-8)-11a recognizing that characteristics LS4 (5-6)-11b tracing a genetic characteristic LS4 (5-6)-11c identifying that genetic material	More Rigorous	As Rigorous	Less Rigorous	
GSEs LS4 (5-6)-11a differentiating between LS4 (5-6)-11b observing recording and LS4 (7-8)-11a recognizing that characteristics LS4 (5-6)-11b tracing a genetic characteristic	More Rigorous o o o o o o o o o o o o o o o o o o	As Rigorous	Less Rigorous	
Concept that genetic information is passed on from GSEs LS4 (5-6)-11a differentiating between LS4 (5-6)-11b observing, recording and LS4 (7-8)-11a recognizing that characteristics LS4 (5-6)-11b tracing a genetic characteristic LS4 (5-6)-11c identifying that genetic material LS4 (5-8) POC-12 Describe the major changes the development from single cell through embryonic at trimesters: 1st - group of cells, 2nd - organs form, 3	More Rigorous o o o o o o o o o o o o o o o o o o	As Rigorous	Less Rigorous	
Concept that genetic information is passed on from GSEs LS4 (5-6)-11a differentiating between LS4 (5-6)-11b observing, recording and LS4 (7-8)-11a recognizing that characteristics LS4 (5-6)-11b tracing a genetic characteristic LS4 (5-6)-11c identifying that genetic material LS4 (5-8) POC-12 Describe the major changes the development from single cell through embryonic attrimesters: 1st - group of cells, 2nd - organs form, 3 GSEs	More Rigorous o o o o o o o o o o o o o o o o o o	As Rigorous Continue in hum to new born trature.	Less Rigorous o o o o o o the control of the contr	
Concept that genetic information is passed on from GSEs LS4 (5-6)-11a differentiating between LS4 (5-6)-11b observing, recording and LS4 (7-8)-11a recognizing that characteristics LS4 (5-6)-11b tracing a genetic characteristic LS4 (5-6)-11c identifying that genetic material LS4 (5-8) POC-12 Describe the major changes the development from single cell through embryonic attrimesters: Ist – group of cells, 2nd – organs form, 3 GSEs LS4 (7-8)-12a identifying and sequencing the	More Rigorous o o o o o o o o o o o o o o o o o o	As Rigorous time in hum to new born tature. As Rigorous	Less Rigorous o o o o o o o tan (i.e.,	
Concept that genetic information is passed on from GSEs LS4 (5-6)-11a differentiating between LS4 (5-6)-11b observing, recording and LS4 (7-8)-11a recognizing that characteristics LS4 (5-6)-11b tracing a genetic characteristic LS4 (5-6)-11c identifying that genetic material LS4 (5-8) POC-12 Describe the major changes the development from single cell through embryonic development	More Rigorous at occur over evelopment to a organs m More Rigorous	As Rigorous time in hum to new born trature. As Rigorous	Less Rigorous O O O O O O O O O O O O O O O O O O	

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Ouestion #4: Does the set of GSEs within each Statement of Enduring Knowledge have the potential to promote coherent instruction? First, is each individual GSE coherent with the Statement of Enduring Knowledge under which it is listed? Second, as a whole, do these GSEs articulate well-balanced coverage of the major concepts within the EK statement? How could they be improved? Go back and review ALL the GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction? GSEs for this EK Statement coherent as a set LS1 - All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species). LS1 (5-8) - INQ+ SAE- 1 Using data and observations about the biodiversity of an Comments ecosystem make predictions or draw conclusions about how the diversity contributes to the stability of the ecosystem. **GSEs** Individual coherence with the Statement of Enduring Knowledge LS1 (5-6) -1a recognizing that organisms 0 LS1 (7-8) –1a giving examples of adaptations ... 0 LS1 (7-8) -1b explaining how organisms with LS1 (5-8) SAE+FAF -2 Describe or compare how different organisms have Comments mechanisms that work in a coordinated way to obtain energy, grow, move, respond, provide defense, enable reproduction, or maintain internal balance (e.g., cells, tissues, organs and systems). Individual coherence with the **GSEs** Statement of Enduring Knowledge No Yes LS1 (5-6)-2a describing structures or... 0 0 0 0 LS1 (7-8)-2a explaining how the cell, as the... 0 LS1 (7-8)-2b observing and describing... LS1 (7-8)-2c observing, describing... LS1 (5-8) POC -3 Compare and contrast sexual reproduction with asexual Comments reproduction. **GSEs** Individual coherence with the Statement of Enduring Knowledge No Yes LS1 (5-6) –3a defining reproduction as a... 0 LS1 (5-6) –3b describing reproduction in... 0 0 LS1 (5-6) -3c investigating and comparing a... 0 0 LS1 (7-8)-3a explaining reproduction as a... 0 LS1 (7-8)-3b describing forms of asexual... LS1 (7-8)-3c describing sexual reproduction... LS1 (5-8) FAF -4 Explain relationships between or among the structure and Comments function of the cells, tissues, organs, and organ systems in an organism. **GSEs** Individual coherence with the Statement of Enduring Knowledge Yes No LS1 (5-6)-4a identifying cells as the building... 0 0 LS1 (5-6)-4b recognizing and illustrating... 0 0 0 LS1 (5-6)-4a explaining that specialized... LS1 (7-8)-4b comparing individual cells... 0 0 LS1 (7-8)–4c explaining how each type of... GSEs for this EK Statement coherent as a set LS2 - Matter cycles and energy flows through an ecosystem. Yes No LS2 (5-8) INQ+SAE-5 Using data and observations, predict outcomes when Comments abiotic/biotic factors are changed in an ecosystem. Individual coherence with the **GSEs** Statement of Enduring Knowledge Yes LS2 (5-6) -5a identifying and defining an... LS2 (7-8)-5a identifying which biotic... 0 0 LS2 (7-8)-5b analyzing how biotic and... 0 0 LS2 (7-8)-5c predicting the outcome of a... 0

LS2 (7-8)-5d using a visual model (e.g., graph)...

Question # 4: Does the set of GSEs within each Statement of Enduring Knowledge have the potential to promote coherent instruction? First, is each individual GSE coherent with the Statement of Enduring Knowledge under which it is listed? Second, as a whole, do these GSEs articulate well-balanced coverage of the major concepts within the EK statement? How could they be improved?

Go back and review ALL the GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction?

	s through an	GSEs for this EK Statement coherent as a set			
LS2 Matter cycles and energy flows	s un ough all	cosystem.	see section above		
TC2 (F.9) CAT (C'	·	, ,			
LS2 (5-8) SAE- 6 Given a scenario trace the flow			Comments		
beginning with the sun, through organisms in the	jood web, and into	tne environment			
(includes photosynthesis and respiration)	T				
GSEs		erence with the			
		uring Knowledge			
TG0 (FC) (:1 (:6: d	Yes	No			
LS2 (5-6)-6a identifying the sun as the major	0	0			
LS2 (5-6)-6b sequencing the energy flow	0	0			
LS2 (5-6)-6c describing the basic processes	0	0			
LS2 (7-8)–6a explaining the transfer of the	0	0			
LS2 (7-8)–6b describing the basic processes	0	0			
LS2 (7-8)– 6c explaining the relationship	0	0			
LS2 (7-8)–6d creating or interpreting a model	0	0			
7.00 (7.0) G177.7 G1					
LS2 (5-8) SAE-7 Given an ecosystem, trace how i			Comments		
organisms and the physical environment (includes		oa web,			
decomposition, recycling but not carbon cycle or i	utrogen cycle).				
CCE	T. 42 * 1 1 1 1				
GSEs		erence with the			
		uring Knowledge			
I \$2 (5.6). To explaining the processes of	Yes	No			
LS2 (5-6)-7a explaining the processes of	0	0			
LS2 (5-6)-7b completing a basic food web for	0	0			
LS2 (7-8)-7a diagramming or sequencing a	0	0			
LS2 (7-8)-7b developing a model for a food	0	0			
LS2 (7-8)-7c explaining the inverse nature	0	0			
LS2 (7-8)-7d conducting a controlled	0	0			
202 (. o) ru conducting a controlled		0			
LS3 - Groups of organisms show ev			e (structures, GSEs for this EK Statement coherent as a set		
			e (structures, GSEs for this EK Statement coherent as a set Yes No No		
LS3 - Groups of organisms show ever behaviors, and biochemistry).	 vidence of cha	nge over time	Yes o No o		
LS3 - Groups of organisms show ev	vidence of cha	nge over time	c (structures,		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classification	vidence of cha	nge over time	Yes o No o		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classificati illustrate, compare, or interpret possible relations.	vidence of cha	nge over time	Yes o No o		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classificate illustrate, compare, or interpret possible relations in the property of the compared and external structures, anatomical interpret possible relations.	ion system, or dicho hips among groups features	nge over time tomous key to of organisms	Yes o No o		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classificatifillustrate, compare, or interpret possible relationsics interpret and external structures anatomical GSEs	ion system, or dicho hips among groups features	nge over time	Yes o No o		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classificate illustrate, compare, or interpret possible relationsly interpret and external structures anatomical GSEs LS3 (5-6)-8a stating the value of, or reasons for	vidence of cha	nge over time tomous key to of organisms erence with the turing Knowledge	Yes o No o		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classification illustrate, compare, or interpret possible relationsics interpret and external structures anatomical GSEs	vidence of cha	nge over time tomous key to of organisms erence with the luring Knowledge No	Yes o No o		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classificate illustrate, compare, or interpret possible relations of the compared external structures anatomical GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar	ion system, or dicho hips among groups features Individual coh Statement of End Yes	nge over time	Yes o No o		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classificate illustrate, compare, or interpret possible relations! (a.g. internal and external structures, anatomical GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to	ion system, or dichonips among groups factures Individual coh Statement of End Yes	nge over time	Yes o No o		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classificate illustrate, compare, or interpret possible relations of the compared external structures anatomical GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar	ion system, or dichohips among groups features Individual coh Statement of End Yes	nge over time	Yes o No o		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classification illustrate, compare, or interpret possible relationships internal and external structures anatomical GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar LS3 (7-8)-8b explaining how species with LS3 (7-8)-8c recognizing the classification	vidence of cha	nge over time	Yes o No o		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classification illustrate, compare, or interpret possible relations if the interpret and external structures anatomical GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar LS3 (7-8)-8b explaining how species with LS3 (7-8)-8c recognizing the classification LS3 (5-8) POC-9 Cite examples supporting the content of the content o	vidence of cha	nge over time	Yes o No o Comments		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classificative illustrate, compare, or interpret possible relations in the compare of the companisms may provide a survival advantage in a second companisms may provide a survival advantage in a second companisms may provide a survival advantage in a second companisms may provide a survival advantage in a second companisms may provide a survival advantage in a second compare of the companisms may provide a survival advantage in a second compare of the compare	vidence of cha	nge over time	Yes o No o Comments		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classification illustrate, compare, or interpret possible relations if the interpret and external structures anatomical GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar LS3 (7-8)-8b explaining how species with LS3 (7-8)-8c recognizing the classification LS3 (5-8) POC-9 Cite examples supporting the content of the content o	vidence of cha	nge over time	Yes o No o Comments		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classificative illustrate, compare, or interpret possible relationships internal and external structures anatomical GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar LS3 (7-8)-8b explaining how species with LS3 (7-8)-8c recognizing the classification LS3 (5-8) POC-9 Cite examples supporting the coorganisms may provide a survival advantage in a san increased likelihood to produce offspring	vidence of cha	nge over time	Yes o No o Comments		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classificative illustrate, compare, or interpret possible relations in the compare of the companisms may provide a survival advantage in a second companisms may provide a survival advantage in a second companisms may provide a survival advantage in a second companisms may provide a survival advantage in a second companisms may provide a survival advantage in a second compare of the companisms may provide a survival advantage in a second compare of the compare	Jones of characters of charact	nge over time tomous key to of organisms erence with the turing Knowledge No craits of nt and therefore,	Yes o No o Comments		
LS3 - Groups of organisms show ever behaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classification illustrate, compare, or interpret possible relations for interpret possible relations for interpret and external structures anatomical GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar LS3 (7-8)-8b explaining how species with LS3 (7-8)-8c recognizing the classification LS3 (5-8) POC-9 Cite examples supporting the coorganisms may provide a survival advantage in a san increased likelihood to produce offspring	Jones of characters of charact	nge over time stomous key to of organisms erence with the uring Knowledge No o o o o o o o o o o o o o o o o o	Yes o No o Comments		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classification illustrate, compare, or interpret possible relations (a.g. internal and external structures anatomical GSEs LS3 (5-6)-8a stating the value of, or reasons for LS3 (5-6)-8b following a taxonomic key to LS3 (7-8)-8a sorting organisms with similar LS3 (7-8)-8c recognizing the classification LS3 (5-8) POC-9 Cite examples supporting the coorganisms may provide a survival advantage in a an increased likelihood to produce offspring	vidence of cha	nge over time stomous key to of organisms erence with the uring Knowledge No craits of nt and therefore, erence with the uring Knowledge	Yes o No o Comments		
LS3 - Groups of organisms show exbehaviors, and biochemistry). LS3 (5-8) MAS+FAF - 8 Use a model, classificative illustrate, compare, or interpret possible relations of the	ion system, or dicho hips among groups factures Individual coh Statement of End Yes oncept that certain is specific environment Individual coh Statement of End Yes	nge over time stomous key to of organisms erence with the uring Knowledge No craits of nt and therefore, erence with the uring Knowledge No	Yes o No o Comments		
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Question # 4: Does the set of GSEs within each Statement of Enduring Knowledge have the potential to promote coherent instruction? First, is each individual GSE coherent with the Statement of Enduring Knowledge under which it is listed? Second, as a whole, do these GSEs articulate well-balanced coverage of the major concepts within the EK statement? How could they be improved?

Go back and review ALL the GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does

Go back and review ALL the GSEs *within* the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs *within* this statement of enduring knowledge have the potential to promote coherent instruction?

See Section above L52 (5-8) SAE- 6 Given a scenario trace the flow of energy through an ecosystem, beginning with the sun, through organisms in the food web, and into the environment time butch phonorymhetics and respiration (SEIS L52 (5-6)-6a identifying the sun as the major L52 (5-6)-6a identifying the sun as the major L52 (5-6)-6a sequencing the energy flow L52 (5-9)-6a sequencing the transfer of the L52 (7-8)-6a explaining the mansfer of the L52 (7-8)-6a explaining the relationship L52 (7-8)-7a explaining the processes of L52 (7-8)-7a explaining the masses at the second processes of L52 (7-8)-7a explaining the masses at the second processes of L52 (7-8)-7a explaining the masses at the second processes of L52 (7-8)-7a explaining the masses at the second processes of L52 (7-8)-7a explaining the masses at the second processes of L52 (7-8)-7a explaining the masses at the second processes of L53 (7-8)-7a explaining the masses at the second processes of L53 (7-8)-7a explaining the masses at the second processes of L53 (7-8)-7a explaining the masses at the second processes of L53 (7-8)-7a explaining the masses at the second processes of L53 (7-8)-8a sorting organisms with similar L53 (7-8)-9a explaining the value of organisms with similar	See Section above LS2 (S-8) SAE- 6 Given a scenario trace the flow of energy through an ecosystem, beginning with the san, through organisms in the food web, and into the environment discussive photosynthesis and respiration) Individual coherence with the Statement of Enduring Knowledge Yes No 1S2 (5-6)-6a identifying the sun as the major 1S2 (5-6)-6a segatement the energy flow 1S2 (5-6)-6a segatement the energy flow 1S2 (7-8)-6a explaining the renarder of the 1S2 (7-8)-6a explaining the renarder of the 1S2 (7-8)-6a explaining the relationship 1S3 (7-8)-7a explaining the relationship 1S3 (7-8)-7a explaining the relationship 1S3 (5-6)-7a explaining the processes of the explaining the relationship 1S3 (5-6)-7a explaining the processes of the explaining the inverse name 1S3 (5-6)-7a explaining the inverse name 1S3 (7-8)-7d conducting a controlled 1S3 (7-8)-7d conducting a controlled 1S3 (5-8)-8a stating the inverse name 1S3 (5-8)-8a stating the value of, or reasons for the explaining the value of, or reasons for the explaining the value of, or reasons for the explaining the way of the explaining the work of the explaining the way of the explaining the explaining how a population s. 1. 1S3 (7-8)-8a explaining how a population s. 1. 1S3 (7-8)-9a explaining how a population s. 1. 1S3 (7-9)-9a explaining how a population	See section above S2 (5-8) SAE - 6 Given a securate tract the flow of energy through an ecosystem, beginning with the case, through an gaminan in the flood web, and into the environment (includes photosynthesis and respiration) S2 (5-6) - 6a identifying the san as the major	LDZ Matter cycles and energy flows		GSEs for this EK Statement coherent as a s		
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Question # 4: Does the set of GSEs within each Statement of Enduring Knowledge have the potential to

promote coherent instruction? First, is each individual GSE coherent with the Statement of Enduring Knowledge under which it is listed? Second, as a whole, do these GSEs articulate well-balanced coverage of the major concepts within the EK statement? How could they be improved? Go back and review ALL the GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction? LS4 - Humans are similar to other species in many ways, and yet are GSEs for this EK Statement coherent as a set unique among Earth's life forms. LS4 (5-8) INQ-10 Use data and observations to support the concept that Comments environmental or biological factors affect human body systems (biotic & abiotic). **GSEs** Individual coherence with the Statement of Enduring Knowledge Yes LS4 (5-6)-10a identifying the biotic factors... 0 LS4 (5-6)-10b identifying the abiotic factors... 0 0 LS4 (5-6)-10c identifying the biotic... 0 LS4 (7-8)-10a predicting and explaining the... 0 0 LS4 (7-8)-10b predicting and explaining the... 0 LS4 (7-8)-10c researching and reporting on... LS4 (5-8) INQ+POC-11 Using data provided, select evidence that supports the concept that genetic information is passed on from both parents to offspring. GSEs Individual coherence with the Statement of Enduring Knowledge Yes No LS4 (5-6)-11a differentiating between ... 0 0 LS4 (5-6)-11b observing, recording and ... 0 0 LS4 (7-8)-11a recognizing that characteristics... 0 LS4 (5-6)-11b tracing a genetic characteristic... 0 0 LS4 (5-6)-11c identifying that genetic material... 0

> Individual coherence with the Statement of Enduring Knowledge

> > Yes

0

0

0

No

0

0

0

LS4 (5-8) POC-12 Describe the major changes that occur over time in human development from single cell through embryonic development to new born (i.e., trimesters: 1^{st} – group of cells, 2^{nd} - organs form, 3^{rd} - organs mature.

LS4 (7-8)-12a identifying and sequencing the...

LS4 (7-8)-12b describing the changes from ...

LS4 (7-8)-12c comparing and contrasting...

LS4 (7-8)-12d describing the patterns of ...

Question #1: Clarity of GSE

Is the GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and state assessment? (Do I understand what learning will be assessed on the state assessment and the related curricular and/or instructional aspects?) If not, what aspect of the GLE needs further clarification? (E.g. clarify terminology, give examples, etc.)

PS1 - All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size or amount of substance)

substance if our another (independe	iit of size o	amount o	1 Substance)
PS1 (5-8) INQ-1 Investigate the relationships am density.	ong mass, volu	Comments	
GSEs	Curriculum/ Instruction	State Assessment	
PS1 (5-6) –1a <u>comparing the masses of</u> PS1 (7-8)–1a measuring mass and volume	0	0	
PS1 (5-8) INQ+POC -2 Given data about charac	teristic properti	es of matter	Comments
(e.g., melting and boiling points, density, solubility			
classify different substances.	ı	T	
GSEs	Curriculum/ Instruction	State Assessment	
PS1 (5-6)–2a recognizing that different	0	0	
PS1 (5-6)-2b classifying and comparing	0	0	
PS1 (7-8) -2a identifying an unknown	0	0	
PS1 (7-8)–2b classifying and comparing	0	0	
PS1 (5-8) INQ+ SAE -3 Collect data or use data		•	Comments
that the total amount of mass in a closed system sta	ays the same, re	gardless of	
how substances interact (conservation of matter) GSEs	Curriculum/	State	
GSES	Instruction	Assessment	
PS1 (5-6)– 3a explaining that regardless	0	0	
PS1 (7-8)-3a citing evidence to conclude	0	0	
PSI (5-8) SAE+MAS – 4			Comments
Represent or explain the relationship between or a	mona enerav n	nolecular	Comments
motion, temperature, and states of matter.	mong energy, n	юши	
GSEs	Curriculum/	State	
	Instruction	Assessment	
PS1 (5-6)-4a differentiating among the	0	0	
PS1 (5-6)-4b predicting the effects of	0	0	
PS1 (7-8)–4a constructing models that	0	0	
PS1 (7-8)-4b explaining the effect of	0	0	
PS1 (7-8)– 4c observing the physical	0	0	
PS1 (5-8) MAS -5 Given graphic or written inform	nation classify	matter as	Comments
atom/molecule or element/compound (Not the stru			
GSEs	Curriculum/ Instruction	State Assessment	
PS1 (5-6)– 5a distinguishing between solutions	0	0	
PS1 (7-8)– 5a using models or diagrams to	0	О	
PS1 (7-8)– 5b classifying elements and	0	0	
PS1 (7-8) – 5c interpreting the symbols and	0	0	
PS1 (7-8) – 5d <u>using symbols and chemical</u>	0	0	
PS1 (7-8) – 5e explaining that when	0	0	
PS1 (7-8)– 5f explaining that when			
	ge to occur	in matter.	Energy can be stored, transferred, and transformed, but
cannot be destroyed.			
PS2 (5-8)-SAE+ POC- 6 Given a real-world examp	ole, show that w	ithin a	Comments

system, energy transforms from one form to another (i.e., chemical, heat, electrical, gravitational, light, sound, mechanical).			
GSEs	Curriculum/ Instruction	State Assessment	
PS2 (5-6)-6a differentiating among the	0	0	
PS2 (5-6)-6b explaining how energy may	0	0	
PS2 (7-8)- 6a using a real world example	0	0	
PS2 (7-8)-6b constructing a model to	0	0	
PS2 (7-8)-6c explaining that while energy	0	0	

Question #1: Clarity of GSE

Is the GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and state assessment? (Do I understand what learning will be assessed on the state assessment and the related curricular and/or instructional aspects?) If not, what aspect of the GLE needs further clarification? (E.g. clarify terminology, give examples, etc.)

PS2 - Energy is necessary for change to occur in matter. Energy can be stored, transferred, and transformed, but cannot be destroyed.

PS2 (5-8) INQ+SAE+POC - 7 Use data to draw c		Comments	
can be transferred (convection, conduction, radiat	ion).		
GSEs	Curriculum/	State	
	Instruction	Assessment	
PS2 (5-6)-7a identifying real world	0	0	
PS2 (5-6)-7b describing sound as the	0	0	
PS2 (5-6)–7c showing that electric	0	0	
PS2 (7-8)-7a designing a diagram, model,	0	0	
PS2 (7-8)–7b explaining the difference	0	0	
PS2 (7-8)–7c representing in words,	0	0	
PS2 (7-8)–7d describing the effect of	0	0	
PS2 (7-8)–7e differentiating between	0	0	

PS3 - The motion of an object is affected by forces.

GSEs	Curriculum/ Instruction	State			
PS3 (5-6)–8a using data or graphs to	nstruction	Assessment			
PS3 (5-6)–8b recognizing that a force is a	0	0			
PS3 (5-6)-8c explaining that changes in	0	0			
PS3 (7-8)-8a measuring distance and time	0	0			
PS3 (7-8)–8b solving for any unknown in	0	0			
PS3 (7-8)–8c differentiating among speed	0	0			
PS3 (7-8)–8d testing predictions on how	0	0			
PS3 (7-8)–8e describing or graphically	0	0			
PS3 (7-8)–8f differentiating between mass	0	0			

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Are the differences between the GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This may be due to increasing difficulty in some related GSE.

PS1 - All living and nonliving things are composed of matter having characteristic properties that distinguish and substance from another (independent of size or amount of substance)

one substance from another (indepe	endent of si	ize or amoı	int of substance)
PS1 (5-8) INQ-1 Investigate the relationships am density	ong mass, volu	me and	Comments
GSEs	Differences are clear	Differences not clear	
PS1 (5-6) –1a <u>comparing the masses of</u> PS1 (7-8)–1a measuring mass and volume	0	0	
PS1 (5-8) INQ+POC -2 Given data about charac (e.g., melting and boiling points, density, solubility classify different substances.) identify, comp	pare, or	Comments
GSEs	Differences are clear	Differences not clear	
PS1 (5-6)–2a recognizing that different PS1 (5-6)–2b classifying and comparing PS1 (7-8)–2a identifying an unknown PS1 (7-8)–2b classifying and comparing	0 0 0	0 0 0	
PS1 (5-8) INQ+ SAE -3 Collect data or use data that the total amount of mass in a closed system stands how substances interact (conservation of matter)			Comments
GSEs	Differences are clear	Differences not clear	
PS1 (5-6)- 3a explaining that regardless PS1 (7-8)-3a <u>citing evidence to conclude</u>	0	0	
PSI (5-8) SAE+MAS – 4 Represent or explain the relationship between or a motion, temperature, and states of matter.	mong energy, i	nolecular	Comments
GSEs	Differences are clear	Differences not clear	
PS1 (5-6)-4a differentiating among the PS1 (5-6)-4b predicting the effects of PS1 (7-8)-4a constructing models that PS1 (7-8)-4b explaining the effect of PS1 (7-8)-4c observing the physical	0 0 0 0	0 0 0 0	
PSI (5-8) MAS -5 Given graphic or written inform atom/molecule or element/compound (Not the stru	/ 35		Comments
GSEs	Differences are clear	Differences not clear	
PS1 (5-6)- 5a distinguishing between solutions PS1 (7-8)- 5a <u>using models or diagrams to</u> PS1 (7-8)- 5b <u>classifying elements and</u> PS1 (7-8)- 5c <u>interpreting the symbols and</u> PS1 (7-8)- 5d <u>using symbols and chemical</u> PS1 (7-8)- 5e <u>explaining that when</u> PS1 (7-8)- 5f <u>explaining that when</u>	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	
PS2 - Energy is necessary for chang	ge to occur	in matter.	Energy can be stored, transferred, and transformed, but

cannot be destroyed.

PS2 (5-8)-SAE+POC- 6 Given a real-world examp	ole, show that w	ithin a	
system, energy transforms from one form to another (i.e., chemical, heat,			
electrical, gravitational, light, sound, mechanical).			
GSEs	Differences	Differences	
	are clear	not clear	
PS2 (5-6)-6a differentiating among the	0	0	
PS2 (5-6)-6b explaining how energy may	0	0	
PS2 (7-8)- 6a using a real world example	0	0	
PS2 (7-8)-6b constructing a model to	0	О	
PS2 (7-8)-6c explaining that while energy	0	0	

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Are the differences between the GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This may be due to increasing difficulty in some related GSE.

PS2 - Energy is necessary for change to occur in matter. Energy can be stored, transferred, and transformed, but cannot be destroyed.

PS2 (5-8) INQ+SAE+POC - 7 Use data to draw co	2 (5-8) INQ+SAE+POC - 7 Use data to draw conclusions about how heat			
can be transferred (convection, conduction, radiati	ion).			
GSEs	Differences	Differences		
	are clear	not clear		
PS2 (5-6)–7a identifying real world	0	0		
PS2 (5-6)-7b describing sound as the	0	0		
PS2 (5-6)–7c showing that electric	0	0		
PS2 (7-8)–7a designing a diagram, model,	0	0		
PS2 (7-8)–7b explaining the difference	0	0		
PS2 (7-8)–7c representing in words,	0	0		
PS2 (7-8)–7d describing the effect of	0	0		
PS2 (7-8)–7e differentiating between	0	0		
· · · · · · · · · · · · · · · · · · ·				

PS 3 - The motion of an object is affected by forces.

PS3 (5-8) INQ+ POC –8 Use data to determine or predict the overall (net effect of multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects.				
GSEs	Differences are clear	Differences not clear		
PS3 (5-6)-8a using data or graphs to	0	o		
PS3 (5-6)–8b recognizing that a force is a	0	0		
PS3 (5-6)-8c explaining that changes in	0	0		
PS3 (7-8)-8a measuring distance and time	О	0		
PS3 (7-8)–8b solving for any unknown in	0	0		
PS3 (7-8)–8c differentiating among speed	О	0		
PS3 (7-8)–8d testing predictions on how	О	0		
PS3 (7-8)–8e describing or graphically	0	0		
PS3 (7-8)–8f differentiating between mass	0	0		

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Question 3: Expected Rigor

Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's science program at that grade span?

PS1 - All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size or amount of substance).

one substance from another (indepe	endent of	f size or a	mount of	f substance).
PS1 (5-8) INQ-1 Investigate the relationships am	ong mass, vo	olume and de	ensity.	Comments
GSEs	More Rigorous	As Rigorous	Less Rigorous	
PS1 (5-6) –1a <u>comparing the masses of</u> PS1 (7-8)–1a measuring mass and volume	0	0	0	
PS1 (5-8) INQ+POC -2 Given data about charac melting and boiling points, density, solubility) iden substances.			. 0,	Comments
GSEs	More Rigorous	As Rigorous	Less Rigorous	
PS1 (5-6)–2a recognizing that different PS1 (5-6)–2b classifying and comparing PS1 (7-8)–2a identifying an unknown	0 0	0 0	0 0	
PS1 (7-8)–2b classifying and comparing	0	0	0	
PS1 (5-8) INQ+ SAE -3 Collect data or use data total amount of mass in a closed system stays the sinteract (conservation of matter).				Comments
GSEs	More Rigorous	As Rigorous	Less Rigorous	
PS1 (5-6)— 3a explaining that regardless PS1 (7-8)-3a citing evidence to conclude	0	0	0	
PS1 (5-8) SAE+MAS – 4 Represent or explain the energy, molecular motion, temperature, and states	•	between or	among	Comments
GSEs	More Rigorous	As Rigorous	Less Rigorous	
PS1 (5-6)-4a differentiating among the PS1 (5-6)-4b predicting the effects of PS1 (7-8)-4a constructing models that	0	0 0	0	
PS1 (7-8)-4b explaining the effect of PS1 (7-8)- 4c observing the physical	0	0	0	
PSI (5-8) MAS -5 Given graphic or written inform atom/molecule or element/compound (Not the stru				Comments
GSEs	More Rigorous	As Rigorous	Less Rigorous	
PS1 (5-6) – 5a distinguishing between solutions	0	0	0	
PS1 (7-8) – 5a <u>using models or diagrams to</u> PS1 (7-8) – 5b <u>classifying elements and</u> PS1 (7-8) – 5c <u>interpreting the symbols and</u>	0 0	0 0	0	
PS1 (7-8)– 5d <u>using symbols and chemical</u> PS1 (7-8)– 5e <u>explaining that when</u>	0	0	0	
PS1 (7-8) – 5f explaining that when	0	0	0	

PS2 - Energy is necessary for change to occur in matter. Energy can be stored, transferred, and transformed, but cannot be destroyed.

PS2 (5-8)-SAE+ POC- 6 Given a real-world examp energy transforms from one form to another (i.e., of gravitational, light, sound, mechanical).	Comments			
GSEs	More	As	Less	
	Rigorous	Rigorous	Rigorous	
PS2 (5-6)-6a differentiating among the	0	0	0	
PS2 (5-6)-6b explaining how energy may	0	0	0	
PS2 (7-8)- 6a using a real world example	0	0	0	
PS2 (7-8)-6b constructing a model to	0	0	0	
PS2 (7-8)-6c explaining that while energy	0	0	0	

Question 3: Expected Rigor

PS3 (7-8)–8b solving for any unknown in... PS3 (7-8)–8c differentiating among speed... PS3 (7-8)–8d testing predictions on how...

PS3 (7-8)–8e describing or graphically...
PS3 (7-8)–8f <u>differentiating between mass....</u>

Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's science program at that grade span?

PS2 - Energy is necessary for change to occur in matter. Energy can be stored, transferred, and transformed, but cannot be destroyed.

PS2 (5-8) INQ+SAE+POC – 7 Use data to draw conclusions about how heat can be transferred (convection, conduction, radiation).				Comments
GSEs	More Rigorous	As Rigorous	Less Rigorous	
PS2 (5-6)-7a identifying real world	0	0	0	
PS2 (5-6)-7b describing sound as the	0	0	0	
PS2 (5-6)–7c showing that electric	0	0	0	
PS2 (7-8)-7a designing a diagram, model,	0	0	0	
PS2 (7-8)–7b explaining the difference	0	0	0	
PS2 (7-8)–7c representing in words,	0	0	0	
PS2 (7-8)–7d describing the effect of	0	0	0	
PS2 (7-8)–7e differentiating between	0	0	0	

PS3 - The motion of an object is affected by forces.

rss (5-6) INQ+ FOC -6 Use data to determine or predict the overall (het effect of multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects.					
More Rigorous	As Rigorous	Less Rigorous			
0	0	0			
0	0	0			
0	0	0			
0	0	0			
	More Rigorous	More As Rigorous Rigorous			

0

0

0

0

0

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Ouestion #4: Does the set of GSEs within each Statement of Enduring Knowledge have the potential to

promote coherent instruction? First, is each individual GSE coherent with the Statement of Enduring Knowledge under which it is listed? Second, as a whole, do these GSEs articulate well-balanced coverage of the major concepts within the EK statement? How could they be improved? Go back and review ALL the GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction? GSEs for this EK Statement coherent as a set PS1 - All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size or amount of substance). PS1 (5-8) INQ-1 Investigate the relationships among mass, volume and density. Comments **GSEs** Individual coherence with the Statement of Enduring Knowledge PS1 (5-6) -1a comparing the masses of... PS1 (7-8)-1a measuring mass and volume. PS1 (5-8) INQ+POC-2 Given data about characteristic properties of matter (e.g., Comments melting and boiling points, density, solubility) identify, compare, or classify different substances. Individual coherence with the **GSEs** Statement of Enduring Knowledge No Yes PS1 (5-6)-2a recognizing that different... 0 0 PS1 (5-6)-2b classifying and comparing... 0 0 PS1 (7-8)-2a identifying an unknown... 0 PS1 (7-8)-2b classifying and comparing. PS1 (5-8) INQ+ SAE -3 Collect data or use data provided to infer or predict that the Comments total amount of mass in a closed system stays the same, regardless of how substances interact (conservation of matter). **GSEs** Individual coherence with the Statement of Enduring Knowledge Yes Nο PS1 (5-6)- 3a explaining that regardless... 0 0 PS1 (7-8)-3a citing evidence to conclude... PS1 (5-8) SAE+MAS - 4 Represent or explain the relationship between or among Comments energy, molecular motion, temperature, and states of matter. Individual coherence with the **GSEs** Statement of Enduring Knowledge No PS1 (5-6)-4a differentiating among the... **PS1** (5-6)-4b predicting the effects of... 0 0 PS1 (7-8)-4a constructing models that... 0 0 PS1 (7-8)-4b explaining the effect of... 0 0 PS1 (7-8)- 4c observing the physical... PS1 (5-8) MAS -5 Given graphic or written information, classify matter as Comments atom/molecule or element/compound (Not the structure of an atom). **GSEs** Individual coherence with the Statement of Enduring Knowledge Yes No PS1 (5-6)– 5a distinguishing between solutions... 0 0 PS1 (7-8)- 5a using models or diagrams to... 0 0 PS1 (7-8)- 5b classifying elements and... 0 0 PS1 (7-8)– 5c interpreting the symbols and... 0 0 PS1 (7-8)- 5d using symbols and chemical... 0 0 PS1 (7-8)– 5e explaining that when... 0 PS1 (7-8)- 5f explaining that when...

Question # 4: Does the set of GSEs within each Statement of Enduring Knowledge have the potential to promote coherent instruction? First, is each individual GSE coherent with the Statement of Enduring Knowledge under which it is listed? Second, as a whole, do these GSEs articulate well-balanced coverage of the major concepts within the EK statement? How could they be improved? Go back and review ALL the GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction? GSEs for this EK Statement coherent as a set PS 2 - Energy is necessary for change to occur in matter. Energy can be stored, transferred, and transformed, but cannot be destroyed. 0 PS2 (5-8)-SAE+POC- 6 Given a real-world example, show that within a system, Comments cnergy transforms from one form to another (i.e., chemical, heat, electrical, gravitational, light, sound, mechanical). **GSEs** Individual coherence with the Statement of Enduring Knowledge PS2 (5-6)-6a differentiating among the... PS2 (5-6)-6b explaining how energy may... 0 0 0 0 PS2 (7-8)- 6a using a real world example... 0 0 PS2 (7-8)-6b constructing a model to... PS2 (7-8)-6c explaining that while energy... PS2 (5-8) INQ+SAE+POC - 7 Use data to draw conclusions about how heat can be Comments transferred (convection, conduction, radiation). Individual coherence with the Statement of Enduring Knowledge Yes No PS2 (5-6)-7a identifying real world... 0 PS2 (5-6)-7b describing sound as the... 0 0 PS2 (5-6)–7c showing that electric... 0 0 PS2 (7-8)-7a designing a diagram, model,... 0 0 0 0 PS2 (7-8)-7b explaining the difference... PS2 (7-8)-7c representing in words,... 0 0 PS2 (7-8)-7d describing the effect of... PS2 (7-8)-7e differentiating between... PS 3 - The motion of an object is affected by forces. GSEs for this EK Statement coherent as a set PS3 (5-8) INQ+ POC -8 Use data to determine or predict the overall (net effect of Comments multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects. Individual coherence with the tatement of Enduring Knowledg PS3 (5-6)-8a using data or graphs to... 0 0 PS3 (5-6)-8b recognizing that a force is a... 0 0 PS3 (5-6)–8c explaining that changes in... 0 PS3 (7-8)-8a measuring distance and time ... 0 0 PS3 (7-8)-8b solving for any unknown in... 0 0 PS3 (7-8)–8c differentiating among speed... 0 0 PS3 (7-8)–8d testing predictions on how... 0 0 PS3 (7-8)-8e describing or graphically... 0 0 PS3 (7-8)–8f differentiating between mass....

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Question # 1: Clarity of GSE

Is the GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and state assessment? (Do I understand what learning will be assessed on the state assessment and the related curricular and/or instructional aspects?) If not, what aspect of the GLE needs further clarification? (E.g. clarify terminology, give examples, etc.).

examples, etc.).	nat aspect of	i the OLL in	eeds further clarification? (E.g. clarify terminology, give
*	s as we kno	w them tod	lay have developed over long periods of time, through
continual change processes.			
ESS1 (5-8) INQ+ POC –1Use geological evidence p that the Earth's crust/lithosphere is composed of pla		ort the idea	Comments
GSEs	Curriculum/ Instruction	State Assessment	
ESS1 (5-6)-1a identifying and describing ESS1 (5-6)-1b plotting location of volcanoes	0	0	
ESS1 (7-8)– 1a citing evidence and developing	0	0	
ESS1 (5-8) SAE-2 Explain the processes that cause out of the atmosphere and their connections to our p			Comments
GSEs	Curriculum/ Instruction	State Assessment	
ESS1 (5-6)–2a diagramming, labeling and ESS1 (5-6)–2b explaining how condensation	0	0	
ESS1 (5-6)–2c developing models to explain ESS1 (5-6)–2d identifying composition and layers	0	0	
			Comments
ESS1 (5-8) POC -3 Explain how earth events (abruabout changes in Earth's surface: landforms, ocean climate.			
GSEs	Curriculum/ Instruction	State Assessment	
ESS1 (5-6)–3a analyzing events to determine ESS1 (7-8)–3a evaluating slow processes	0	0	
ESS1 (7-8)–3b evaluating fast processes	0	0	
ESS1 (7-8)–3c investigating the effect of	0	0	
ESS1 (5-8) SAE+ POC -4 Explain the role of different states of the state of the sta			Comments
in ocean currents, winds, weather and weather patter GSEs	Curriculum/ Instruction	State Assessment	
ESS1 (5-6)-4a explaining how differential	0	0	
ESS1 (5-6)-4b describing how differential ESS1 (5-6)-4c explaining the relationship	0	0	
ESS1 (5-6)-4d analyzing global patterns of	0	0	
ESS1 (5-6)–4e predicting temperature and			Comments
ESS1 (5-8) INQ+ POC -5 Using data about a rock make and support an inference about the rock's hist cycle.			
GSEs	Curriculum/ Instruction	State Assessment	
ESS1 (5-6)-5a representing the processes ESS1 (5-6)-5b citing evidence and developing	0	0	
ESS2 - The earth is part of a solar sy interrelationships.	stem, made	e up of disti	inct parts that have temporal and spatial
ESS2 (5-8) MAS -6 Compare and contrast planets size, composition, location, orbital movement, atm (includes moons).	_		Comments
GSEs	Curriculum/	State	
ESS2 (5-6)-6a identifying and comparing the ESS2 (5-6)-6b comparing the composition,	Instruction o o	Assessment	

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Question #1: Clarity of GSE Is the GSE articulated in a way that it is clear what is expected of classroom instruction/curriculum and state assessment? (Do I understand what learning will be assessed on the state assessment and the related curricular and/or instructional aspects?) If not, what aspect of the GLE needs further clarification? (E.g. clarify terminology, give examples, etc.) ESS2 - The earth is part of a solar system, made up of distinct parts that have temporal and spatial interrelationships. ESS2 (5-8) NOS -7 Explain how technological advances have allowed scientists to re-evaluate or extend existing ideas about the solar system. Comments **GSEs** Curriculum/ State Instruction Assessment ESS2 (7-8)-7a identifying major discoveries... ESS2 (5-8) SAE+ POC -8 Explain temporal or positional relationships between Comments or among the Earth, sun, and moon (e.g., night/day, seasons, year, tides) OR how gravitational force affects objects in the solar system (e.g., moons, tides, GSEs Curriculum/ State Instruction Assessment ESS2 (5-6)-8a using models to describe the ... ESS2 (5-6)-8b explaining night/day, seasons... ESS2 (5-6)-8c using a model of the Earth, sun... $\underline{ESS2} \ (\textbf{5-6})\textbf{-8d} \ \underline{\underline{defining the Earth's gravity}}...$ 0 0 ESS2 (7-8)-8a using or creating a model of the... ESS2 (7-8)-8b explaining night/day, seasons... 0 0 ESS2 (7-8)-8c using a model of the Earth, sun... 0 0 ESS2 (7-8)-8d describing the effect of mass... 0 0 ESS2 (7-8)-8e describing the effect of distance... 0 ESS2 (7-8)-8f explaining that the sun's... ESS3 - The origin and evolution of galaxies and the universe demonstrate fundamental principles of physical science across vast distances and time There are no ESS3 State Assessment Targets at this grade span. The GSEs listed below are assessed at the local level only

Curriculum/

Instruction

0

ESS3 (5-6)-9a describing the apparent...

ESS3 (5-6)-9b identifying the sun as a...

ESS3 (7-8)-9a describing the universe as...

State

Assessment

0

0

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(includes moons).

ESS2 (5-6)-6a identifying and comparing the... ESS2 (5-6)-6b comparing the composition,...

GSEs

Are the differences between the GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This may be due to increasing difficulty in some related GSE.

${\it ESS1}$ - The earth and earth materials as we know them today have developed over long periods of time, through continual change processes.

continual change processes.			
ESSI (5-8) INQ+ POC -1Use geological evidence p that the Earth's crust/lithosphere is composed of ple		ort the idea	Comments
GSEs	Differences	Differences	
	are clear	not clear	
ESS1 (5-6)-1a identifying and describing	0	0	
ESS1 (5-6)-1b plotting location of volcanoes	0	0	
ESS1 (7-8)– 1a citing evidence and <u>developing</u>	0	0	
ESS1 (5-8) SAE-2 Explain the processes that cause	e the cycling of	water into and	Comments
out of the atmosphere and their connections to our	planet's weather	r patterns.	
GSEs	Differences	Differences	
	are clear	not clear	
ESS1 (5-6)-2a diagramming, labeling and	0	0	
ESS1 (5-6)–2b explaining how condensation	0	0	
ESS1 (5-6)–2c developing models to explain	0	0	
ESS1 (5-6)–2d <u>identifying composition and layers</u>	0	0	
			Comments
ESS1 (5-8) POC -3 Explain how earth events (abru	iptly and over ti	me) can bring	
about changes in Earth's surface: landforms, ocean	i floor, rock feat	tures, or	
climate.			
GSEs	Differences	Differences	
ESC1 (5 () 2lu-int- t- determine	are clear	not clear	
ESS1 (5-6)–3a analyzing events to determine ESS1 (7-8)–3a evaluating slow processes	0	0	
ESS1 (7-8)–3a evaluating slow processes ESS1 (7-8)–3b evaluating fast processes	0	0	
ESS1 (7-8)–3c investigating the effect of	0	0	
` ′			
ESSI (5-8) SAE+ POC -4 Explain the role of diffin ocean currents, winds, weather and weather patte			Comments
GSEs	Differences	Differences	
GSES	are clear	not clear	
ESS1 (5-6)-4a explaining how differential	0	0	
ESS1 (5-6)-4b describing how differential	0	0	
ESS1 (5-6)-4c explaining the relationship	0	0	
ESS1 (5-6)-4d analyzing global patterns of	0	0	
ESS1 (5-6)–4e predicting temperature and	0	0	
ESSI (5-8) INQ+ POC -5 Using data about a rock	's physical char	racteristics	Comments
make and support an inference about the rock's his			
cycle.	·		
GSEs	Differences	Differences	
ESS1 (5-6)-5a representing the processes	are clear	not clear	
ESS1 (5-6)-5b citing evidence and developing	0	0	
	stem made	un of disti	nct parts that have temporal and spatial
	seem, mau	ap or distr	mer par to that have temperar and spatial
interrelationships.			
			Comments
ESS2 (5-8) MAS -6 Compare and contrast planets			
size, composition, location, orbital movement, atm	iosphere, or su	rjace features	

Differences

not clear

Differences

are clear

Are the differences between the GSEs of adjacent grade spans clear? They should show the appropriate developmental growth as they progress K - high school.

NOTE: In some cases, no differences are articulated between the adjacent (corresponding) GSEs. This may be due to increasing difficulty in some related GSE.

ESS2 - The earth is part of a solar system, made up of distinct parts that have temporal and spatial interrelationships.

inter relationships.				
ESS2 (5-8) NOS -7 Explain how technological adv	vances have allo	wed scientists		
to re-evaluate or extend existing ideas about the solar system.				
GSEs	Differences	Differences		
	are clear	not clear		
ESS2 (7-8)-7a identifying major discoveries	0	0		
ESS2 (5-8) SAE+ POC -8 Explain temporal or posor among the Earth, sun, and moon (e.g., night/day, how gravitational force affects objects in the solar sorbits, satellites) GSEs ESS2 (5-6)-8a using models to describe the	, seasons, year,	tides) OR		
ESS2 (5-6)-8b explaining night/day, seasons	0	0		
ESS2 (5-6)-8c using a model of the Earth, sun	1			
	0	0		
ESS2 (5-6)-8d defining the Earth's gravity	0	0		
ESS2 (5-6)-8d <u>defining the Earth's gravity</u> ESS2 (7-8)-8a using or <u>creating a model</u> of the	_	_		
	0	0		
ESS2 (7-8)-8a using or creating a model of the	0	0		
ESS2 (7-8)–8a using or <u>creating a model</u> of the ESS2 (7-8)–8b <u>explaining night/day, seasons</u>	0	0		
ESS2 (7-8)–8a using or <u>creating a model</u> of the ESS2 (7-8)–8b <u>explaining night/day, seasons</u> ESS2 (7-8)–8c <u>using a model of the Earth, sun</u>	0 0 0	0 0 0		
ESS2 (7-8)-8a using or <u>creating a model</u> of the ESS2 (7-8)-8b <u>explaining night/day, seasons</u> ESS2 (7-8)-8c <u>using a model of the Earth, sun</u> ESS2 (7-8)-8d <u>describing the effect of mass</u>	0 0 0	0 0 0 0 0		

ESS3 - The origin and evolution of galaxies and the universe demonstrate fundamental principles of physical science across vast distances and time

There are no ESS3 State Assessment Targets at this listed below are assessed at the local level only	grade span. Ti	Comments	
GSEs	Differences are clear	Differences not clear	
ESS3 (5-6)-9a describing the apparent	0	0	
ESS3 (5-6)-9b identifying the sun as a	0	0	
ESS3 (7-8)-9a describing the universe as	0	0	

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Question 3: Expected Rigor

Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's science program at that grade span?

ESS1 - The earth and earth materials as we know them today have developed over long periods of time, through

ESS1 (5-8) INQ+ POC –1Use geological evidence the Earth's crust/lithosphere is composed of plates	•	Comments		
GSEs	More Rigorous	As Rigorous	Less Rigorous	
ESS1 (5-6)-1a identifying and describing	0	0	0	
ESS1 (5-6)-1b plotting location of volcanoes	0	0	0	
ESS1 (7-8)– 1a citing evidence and developing	0	0	0	
ESSI (5-8) SAE-2 Explain the processes that cau of the atmosphere and their connections to our pla		Comments		
GSEs	More Rigorous	As Rigorous	Less Rigorous	
ESS1 (5-6)–2a diagramming, labeling and	0	0	0	
ESS1 (5-6)–2b explaining how condensation	0	0	0	
ESS1 (5-6)–2c developing models to explain	0	0	0	
ESS1 (5-6)–2d identifying composition and	0	0	0	
ESS1 (5-8) POC-3 Explain how earth events (abruptly a Earth's surface: landforms, ocean floor, rock features, av		Comments		
GSEs	More Rigorous	As Rigorous	Less Rigorous	
ESS1 (5-6)-3a analyzing events to determine	0	0	0	
ESS1 (7-8)–3a evaluating slow processes	0	0	0	
ESS1 (7-8)–3b evaluating fast processes	0	0	0	
==== () += e-taratang rast processes				

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Question 3: Expected Rigor	Question 3: Expected Rigor								
Is the GSE more rigorous, similar to, or less rigorous than what is presently expected in your school's									
science program at that grade span?									
ESS1 - The earth and earth materials as we know them today have developed over long periods of time, through									
continual change processes.									
ESS1 (5-8) SAE+POC -4 Explain the role of diffe				Comments					
ocean currents, winds, weather and weather pattern									
GSEs	More Rigorous	As Rigorous	Less Rigorous						
ESS1 (5-6)-4a explaining how differential	0	0	0						
ESS1 (5-6)-4b describing how differential	0	0	0						
ESS1 (5-6)-4c explaining the relationship	0	0	0						
ESS1 (5-6)-4d analyzing global patterns of ESS1 (5-6)-4e predicting temperature and	0	0	0						
				Comments					
ESS1 (5-8) INQ+ POC –5 Using data about a roc and support an inference about the rock's history				Comments					
GSEs	More	As	Less						
	Rigorous	Rigorous	Rigorous						
ESS1 (5-6)-5a representing the processes	0	0	0						
ESS1 (5-6)-5b citing evidence and developing	0	0	0						
ESS2 - The earth is part of a solar sy	stem, ma	ae up oi	aistinct p	parts that have temporal and spatial					
interrelationships.									
ESS2 (5-8) MAS -6 Compare and contrast planet composition, location, orbital movement, atmospi				Comments					
moons).	nere, or sur	jace jeatures	s (inciuaes						
GSEs	More	As	Less						
	Rigorous	Rigorous	Rigorous						
ESS2 (5-6)-6a identifying and comparing the	0	0	0						
ESS2 (5-6)-6b comparing the composition,	O	O	0						
ESS2 (5-8) NOS -7 Explain how technological adv	ances have a	ıllowed scien	tists to re-	Comments					
evaluate or extend existing ideas about the solar sys			ı						
GSEs	More Rigorous	As Rigorous	Less Rigorous						
ESS2 (7-8)-7a identifying major discoveries	0	0	0						
ESS2 (5-8) SAE+ POC -8 Explain temporal or pos	ritional relati	onchine hatw	aan or						
among the Earth, sun, and moon (e.g., night/day, se				Comments					
gravitational force affects objects in the solar system									
GSEs	More	As	Less						
ESS2 (5-6)-8a using models to describe the	Rigorous	Rigorous	Rigorous						
ESS2 (5-6)-8b explaining night/day, seasons	0	0	0						
ESS2 (5-6)-8c using a model of the Earth, sun	0	0	0						
ESS2 (5-6)-8d defining the Earth's gravity	0	0	0						
ESS2 (7-8)-8a using or creating a model of the ESS2 (7-8)-8b explaining night/day, seasons	0	0	0						
ESS2 (7-8)–8c using a model of the Earth, sun	0	0	0						
ESS2 (7-8)-8d describing the effect of mass	0	0	0						
ESS2 (7-8)-8e describing the effect of distance	0	0	0						
ESS2 (7-8)-8f explaining that the sun's		O The CSE all	o atad balam	Compression					
There are no ESS3 State Assessment Targets at this are assessed at the local level only	graae span.	ine GSEs li	stea below	Comments					
GSEs	More	As	Less						
FSS3 (5.6) On describing the apparent	Rigorous	Rigorous	Rigorous						
ESS3 (5-6)-9a describing the apparent ESS3 (5-6)-9b identifying the sun as a	0	0	0						
ESS3 (7-8)-9a describing the universe as	0	0	0						
(, o) > a describing the universe us			Į.						

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Question # 4: Does the set of GSEs within each Statement of Enduring Knowledge have the potential to promote coherent instruction? First, is each individual GSE coherent with the Statement of Enduring Knowledge under which it is listed? Second, as a whole, do these GSEs articulate well-balanced coverage of the major concepts within the EK statement? How could they be improved?

Go back and review ALL the GSEs *within* the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs *within* this statement of enduring knowledge have the potential to promote coherent instruction?

set of GSEs within this statement of en	iduring knowle	age have the p	otentiai to promo	te conerent in	SH uction?	
ESS 1 - The earth and earth materia	ıls as we know	them today h	ave developed	GSEs for this	EK Statement coherent as a se	
over long periods of time, through co		<u>-</u>		Yes	No o	
ESS1 (5-8) INQ+ POC –1Use geological evidence p Earth's crust/lithosphere is composed of plates that		Comments				
GSEs		erence with the luring Knowledge				
	Yes	No				
ESS1 (5-6)–1a identifying and describing	0	0				
ESS1 (5-6)-1b plotting location of volcanoes	0	0				
ESS1 (7-8)– 1a citing evidence and developing	0	0				
ESS1 (5-8) SAE-2 Explain the processes that cause the atmosphere and their connections to our planet		er into and out of		Commen	ats	
GSEs		erence with the				
	Statement of End Yes	luring Knowledge No				
ESS1 (5-6)–2a diagramming, labeling and	·	0				
ESS1 (5-6)–2b explaining how condensation	0	0				
ESS1 (5-6)-2c developing models to explain	0	0				
ESS1 (5-6)–2d identifying composition and layers	0	0				
	<u> </u>	<u> </u>		Commen	nts	
ESS1 (5-8) POC -3 Explain how earth events (abru	untly and avantima	can bring about		Commen		
changes in Earth's surface: landforms, ocean floor	, rock features, or c	limate.				
GSEs		erence with the				
	Yes	luring Knowledge No				
ESS1 (5-6)-3a analyzing events to determine	o	0				
ESS1 (7-8)–3a evaluating slow processes	0	0				
ESS1 (7-8)–3b evaluating fast processes	0	0				
ESS1 (7-8)–3c investigating the effect of	0	0				
ESS1 (5-8) SAE+ POC -4 Explain the role of diff ocean currents, winds, weather and weather pattern				Commen	ats	
GSEs		erence with the				
GDES		luring Knowledge				
	Yes	No				
ESS1 (5-6)-4a explaining how differential	0	0				
ESS1 (5-6)-4b describing how differential	0	0				
ESS1 (5-6)-4c explaining the relationship	0	0				
ESS1 (5-6)-4d analyzing global patterns of	0	0				
ESS1 (5-6)—4e predicting temperature and	·	o		-	4-	
ESS1 (5-8) INQ+ POC -5 Using data about a rock support an inference about the rock's history and co				Commen	nts	
GSEs		erence with the				
COLO		luring Knowledge				
	Yes	No				
ESS1 (5-6)-5a representing the processes	0	0				
ESS1 (5-6)-5b citing evidence and developing	0	0	-			
ESS2 - The earth is part of a solar sy		p of distinct p	arts that have		EK Statement coherent as a se	
temporal and spatial interrelationsh	ips.			Yes o	No o	
ESS2 (5-8) MAS -6 Compare and contrast plane composition, location, orbital movement, atmosp				Commen	ats	
moons).		2.2 .2				
GSEs		erence with the				
	Yes Yes	luring Knowledge No				
FSS2 (5.6) 60 identifying and assumption the	o	0				
ESS2 (5-6)-6a identifying and comparing the ESS2 (5-6)-6b comparing the composition,	0	0				
ESS2 (5-0)-00 comparing the composition,		*				

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Question #4: Does the set of GSEs within each Statement of Enduring Knowledge have the potential to

promote coherent instruction? First, is each individual GSE coherent with the Statement of Enduring Knowledge under which it is listed? Second, as a whole, do these GSEs articulate well-balanced coverage of the major concepts within the EK statement? How could they be improved? Go back and review ALL the GSEs within the Statement of Enduring Knowledge looking at them as a "GSE set." Does the set of GSEs within this statement of enduring knowledge have the potential to promote coherent instruction? GSEs for this EK Statement coherent as a set ESS2 - The earth is part of a solar system, made up of distinct parts that have temporal and spatial interrelationships. see section above ESS2 (5-8) NOS-7 Explain how technological advances have allowed scientists to reevaluate or extend existing ideas about the solar system. Comments Individual coherence with the GSEs Statement of Enduring Knowledge ESS2 (7-8)-7a identifying major discoveries... ESS2 (5-8) SAE+ POC -8 Explain temporal or positional relationships between or Comments among the Earth, sun, and moon (e.g., night/day, seasons, year, tides) OR how gravitational force affects objects in the solar system (e.g., moons, tides, orbits, GSEs Individual coherence with the Statement of Enduring Knowledge ESS2 (5-6)-8a using models to describe the ... 0 0 ESS2 (5-6)-8b explaining night/day, seasons... ESS2 (5-6)-8c using a model of the Earth, sun... 0 0 ESS2 (5-6)-8d defining the Earth's gravity... ESS2 (7-8)-8a using or creating a model of the... 0 ESS2 (7-8)-8b explaining night/day, seasons... ESS2 (7-8)-8c using a model of the Earth, sun... 0 0 ESS2 (7-8)-8d describing the effect of mass... 0 0 ESS2 (7-8)-8e describing the effect of distance... 0 ESS2 (7-8)-8f explaining that the sun's... ESS3 - The origin and evolution of galaxies and the universe demonstrate GSEs for this EK Statement coherent as a set Yes fundamental principles of physical science across vast distances and time There are no ESS3 State Assessment Targets at this grade span. The GSEs listed below Comments are assessed at the local level only. **GSEs** Individual coherence with the Statement of Enduring Knowledge No ESS3 (5-6)-9a describing the apparent... 0 0 ESS3 (5-6)-9b identifying the sun as a... 0 0 ESS3 (7-8)-9a describing the universe as. 0 0

Question #5: What science content (important concepts) is missing in these draft science GSEs? Where are there gaps in content? This information is most essential for developing the science GSEs for local curriculum, instruction and assessment.

Relevant EK (Identify by domain and number - ex. LS1)	Content/Concepts Needing Inclusion (Please provide as much detail as possible)	

Appendix A: GSE Development in Science

Givens:

- GSEs in science are developed in grade spans K-2, 3-4, 5-6, 7-8 and high school.
- High school science GSEs for <u>all</u> students cover the content and skills eligible for the large-scale assessment given at the end of Grade 11.
- Examples of "Extensions" to the high school science GSEs are provided to guide the more in depth study of particular topic and for local curriculum and assessment
- The science GSEs are for state assessment and local curriculum and assessment purposes.
- The science GSEs are aligned with, but not necessarily limited by, existing state frameworks.

Purpose of GSE: The science GSEs are specified for a common, large-scale, state level assessment, and some are identified for local curriculum and assessment option.

Definition of a GSE: A science GSE is a stated objective that is aligned with the Rhode Island science framework and the national science standards, by grade span. A GSE differentiates performance on concepts, skills, or content knowledge between adjacent grade levels and spans, and as a set, leads to focused, coherent, and developmentally appropriate instruction without narrowing the curriculum

Criteria for the Development of GSEs:

- 1) GSEs in science **must** relate to national science standards, but not be limited by them.
- 2) GSEs should maintain a balance between a generalizable skill, concept, or piece of knowledge, **and** enough specificity to differentiate skill, concept, or knowledge between adjacent grades, to make it clear to teachers what is to be taught and learned, without being so specific that it narrows the curriculum.
- 3) GSEs should explicitly indicate cognitive demand (interaction of content and process). There should be a mix of cognitive demands at all grade levels, not an assumption that students in lower grades do less cognitively demanding work. (The verbs used in the construction of the science GSEs are consistent with the Webb's Depth of Knowledge (DOK) levels. Most science GSEs are written at DOK levels 2 and 3) see TABLE 1
- 4) GSEs should be specific and clear enough to know how they will be assessed.
- 5) GSEs should contain language that describes expected performance so that a student's achievement in relation to the GSE can be validly assessed for state assessment purposes.
 - a. **Not assessable** E.g., "Students demonstrate an understanding of characteristic properties of matter."
 - b. **Assessable** E.g., Students demonstrate an understanding of characteristic properties of matter by <u>citing evidence</u> (e.g., <u>prior knowledge</u>, <u>data</u>) to support conclusions about why objects are grouped/<u>not grouped together</u>

Criteria for the Development of a SET of Grade Span Expectation in Science

- The set of GSEs should be of comparable grain size.
- Concepts, skills, and knowledge should be differentiated between adjacent grade spans.
- The set of GSEs within a domain of science (Life Science, Physical Science, Earth and Space Science) and the Statement of Enduring Knowledge reflects the relative importance as defined by a review of national and state science standards.
- The set of GSEs should promote coherent, focused, developmentally appropriate instruction, as opposed to isolated instruction *just* on topics, facts, or individual skills that need to be covered.
- The set of GSEs should be reasonable to learn adequately (assuming prior learning).
- The set of GSEs should be constructed as a continuum of learning. Success in one grade span should be a good predictor of success in the following year.
- Success on GSEs across multiple years should be a good predictor of performance at the national benchmark years. (i.e., NAEP).

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TABLE 1 Sample 1 (working draft K. Hess, updated Septe	Descriptors for each of the l	DOK Levels in Science, base	ed on Webb
Level 1 Recall & Reproduction	Level 2 Skills & Concepts	Level 3 Strategic Thinking	Level 4 Extended Thinking
a. Recall or recognize a fact, term, definition, simple procedure (such as one step), or property b. Demonstrate a rote response c. Use a well-known formula d. Represent in words or diagrams a scientific concept or relationship e. Provide or recognize a standard scientific representation for simple phenomenon f. Perform a routine procedure, such as measuring length g. Perform a simple science process or a set procedure (like a recipe) h. Perform a clearly defined set of steps i. Identify, calculate, or measure	 a. Specify and explain the relationship between facts, terms, properties, or variables b. Describe and explain examples and nonexamples of science concepts c. Select a procedure according to specified criteria and perform it d. Formulate a routine problem given data and conditions e. Organize, represent, and compare data f. Make a decision as to how to approach the problem g. Classify, organize, or estimate h. Compare data i. Make observations j. Interpret information from a simple graph k. Collect and display data 	a. Interpret information from a complex graph (such as determining features of the graph or aggregating data in the graph) b. Use reasoning, planning, and evidence c. Explain thinking (beyond a simple explanation or using only a word or two to respond) d. Justify a response e. Identify research questions and design investigations for a scientific problem f. Use concepts to solve non-routine problems/more than one possible answer g. Develop a scientific model for a complex situation h. Form conclusions from experimental or observational data i. Complete a multi-step problem that involves planning and reasoning	a. Select or devise approach among many alternatives to solve problem b. Based on provided data from a complex experiment that is novel to the student, deduct the fundamental relationship between several controlled variables. c. Conduct an investigation, from specifying a problem to designing and carrying out an experiment, to analyzing its data and forming conclusions d. Relate ideas within the content area or among content areas e. Develop generalizations of the results obtained and the strategies used and apply them to new problem situations
NOTE: If the knowledge necessary to answer an item automatically provides the answer, it is a Level 1.	NOTE: If the knowledge necessary to answer an item does not automatically provide the answer, then the item is at least a Level 2. Most actions imply more than one step. NOTE: Level 3 is complex and abstract. If more than one response is possible, it is at least a Level 3 and calls for use of reasoning, justification, evidence, as support for the response.	 j. Provide an explanation of a principle k. Justify a response when more than one answer is possible l. Cite evidence and develop a logical argument for concepts m. Conduct a designed investigation n. Research and explain a scientific concept O. Explain phenomena in terms of concepts 	NOTE: Level 4 activities often require an extended period of time for carrying out multiple steps; however, time alone is not a distinguishing factor if skills and concepts are simply repetitive over time.